Guidance for Flood Risk Analysis and Mapping

Quality Management for Flood Risk Projects

December 2020

FEMA

Requirements for the Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) Program are specified separately by statute, regulation, or FEMA policy (primarily the Standards for Flood Risk Analysis and Mapping). This document provides guidance to support the requirements and recommends approaches for effective and efficient implementation. Alternate approaches that comply with all requirements are acceptable.

For more information, please visit the FEMA Guidelines and Standards for Flood Risk Analysis and Mapping webpage (www.fema.gov/flood-maps/guidance-partners/guidelines-standards). Copies of the Standards for Flood Risk Analysis and Mapping policy, related guidance, technical references, and other information about the guidelines and standards development process are all available here. You can also search directly by document title at www.fema.gov/multimedia-library.

Table of Revisions

The following summary of changes details revisions to this document subsequent to its most recent version in February 2018.

Affected Section or Subsection	Date	Description
Section 1	December 2020	This guidance document has been updated to add information regarding Automated Map Production.

This Document is Superceded. For Reference Only.

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1.0 Automated Map Production (AMP)

To support greater automation within the Risk MAP Program, FEMA is developing a tool within the Mapping Information Platform (MIP) called Automated Map Production (AMP). AMP will automate FIRM panel creation, replacing previous practices of manual cartography. The goal of AMP is to eliminate the need for manual edits or adjustments to labels on the FIRM panels and FIRM index.

AMP will read the data in a submitted FIRM database and use a series of cartographic algorithms, with established rules of hierarchy, to autogenerate FIRM panels and indexes that comply with FEMA requirements through all study stages (e.g. draft, preliminary, and final). However, AMP will not change the engineering analysis or alter the FIRM database (i.e. geodatabase; shapefiles). AMP will not fix errors in the submitted FIRM database (e.g. topology). It will continue to be the responsibility of the FIRM database producer to perform quality assurance / quality control (QA/QC) to make sure the submitted data meets all Risk MAP standards. Producers will also be expected to visually review the auto generated AMP panels to determine if they meet expectations or require changes. If updates are needed, the producer will edit the FIRM database and then resubmit to the MIP as usual to begin the process over, to include required DVT submittals.

As AMP is introduced into the Risk MAP study lifecycle, producers need to understand how it will impact the information in this document. While the mission of AMP is to replicate the FIRM panel and FIRM index requirements as known today, there will be changes to the output panels that do not directly align with the guidance and direction in this and other Risk MAP documents. AMP panels will have slight variations from what producers and users have seen since the beginning of Risk MAP. FEMA will develop a best practice document to summarize these changes. Because AMP will be enhanced through future agile development cycles, changes will likely occur more frequently than the annual Guidelines and Standards (G&S) cycle. Therefore, the best practice model will be the most efficient way to provide up-to-date information on changes. Future edits to this document will be made to align the information between this and the AMP best practice document.

2.0 Quality Management for Flood Risk Projects

An effective functioning Quality Management System (QMS) is best comprised of a balance between proactive Quality Assurance (QA) preventive protocols, reactive Quality Control (QC) validation protocols, and continuous process improvement (root cause analysis and process improvement). These items are normally best described and documented in a Quality Management Plan (QMP). Each of these elements should be focused on compliance with the Standards for Flood Risk Analysis and Mapping, which are codified in a FEMA Policy memorandum. The FEMA Risk MAP standards associated with quality management may be found on FEMA's Guidelines and Standards for Flood Risk Analysis and Mapping website at www.fema.gov/flood-maps/guidance-partners/guidelines-standards. The Master Index located at www.fema.gov/media-library/assets/documents/94095 helps users to identify all the standards related to each guidance topic. FEMA's Knowledge Sharing Site (KSS) is a tool available to FEMA and their Mapping Partner's to assist in searches for standards, guidance, technical references, and best practices, and is located on FEMA's Risk Management Directorate Portal rmd.msc.fema.gov/SitePages/RMD.aspx. A summary of the key concepts that support the standards are shown in Table 1.

Table 1: Quality Management Key Concepts

Concept	Description
Quality Reviews (QRs)	Regulatory Quality Reviews (QRs) (QR1-QR8) must be conducted and all quality and technical review comments must be addressed and resolved.
Self-Certification	Certain QRs require self-certification by the producer before the QR may be conducted, and that self-certification must be documented and archived in the Mapping Information Platform (MIP) before the study moves forward.
Archiving Quality Records	All relevant data that fully documents the flood risk project, including all Regulatory QR checklists (QR3 through QR8) must be properly archived on the MIP for each project. Note that QR1 and QR2 do not have standard checklists due to the nature of the review.
Quality Management Plan	A Quality Management Plan (QMP) must be in place to ensure consistent compliance with FEMA standards.

2.1 Quality Assurance (QA) Elements

Consistent with FEMA's goal to build quality into the production process and thereby minimize the need for independent reviews, there are multiple QA elements in place to enable this vision to be realized. QA elements of the program are summarized in Table 2, with a more complete explanation for select elements being provided throughout this document.

Table 2: Quality Assurance Elements

FEMA Quality Assurance Management Plan (QAMP): Provides overarching program guidance for quality management expectations.
FEMA Risk MAP Standards, Guidance, Technical References, and Best Practices: A suite of resources for Mapping Partners involved in Flood Risk Project production activities that provides clear requirements and which includes codified exceptions protocols for the Standards.
FEMA Knowledge Sharing Site (KSS): Provides an interface for Mapping Partners to find multiple information resources associated with Flood Risk Analysis and Mapping, including the Risk MAP Standards, Guidance, Technical References, and Best Practices.
Contractor Self-Certification: This protocol, codified by Risk MAP standard 512 (see Table 1) builds quality into the production process and ensures traceability and accountability in the event of root cause analysis for critical non-compliances.
FEMA Sponsored Training: FEMA offers multiple training opportunities for contractors and Cooperating Technical Partners (CTPs) to help them build quality into Flood Risk Products. Many of these training opportunities are presented as webinars and are focused on new and revised standards and guidance. These webinars are normally open to all mapping partners and CTPs and provide an opportunity for questions and answer regarding the ever evolving suite of Risk MAP standards and guidance. The webinars are also normally recorded and available on the FEMA KSS.
Contractor and CTP Quality Management Plans (QMPs): These provide a framework to ensure the proper balance of preventive measures with validation measures, while enabling provisions for corrective action and continuous process improvement. QMPs should generally include the following components: • Provisions for Training • Provisions for Process Definition and Documentation   ○ Quality Management is founded on process management; for that reason, it is critical that all core processes be well defined and documented to the greatest degree possible to minimize reliance on institutional knowledge and to ensure that all production staff members follow similar production protocols. • Provisions for Document Control and Knowledge Management • Provisions for Independent Validation Protocols enabled by qualified reviewers • Provisions for Corrective Action Processes • Provisions for Continuous Process Improvement (arising from Best Practices and Lessons Learned) • Provisions for regularly updating the Quality Management Plan
Quality Management System (QMS) Audits: Even the best QMP will not ensure compliance with Standards for Flood Risk Analysis and Mapping. It is therefore critical that regular internal and external audits of compliance with the QMS and QMP are conducted. The process and the nature of these audits may vary, but should include the following elements at a minimum: • Validation of proper execution of documented production processes • Validation that all staff have access to, and are properly using, the provided Knowledge Management System • Validation that properly qualified staff are used to execute validation activities • Validation that all non-compliance citations are properly resolved • Validation that quality records are being properly maintained

2.2 Quality Control (QC) Elements

QC protocols are used to validate that the product meets FEMA standards and guidance. Table 3 provides a summary of these elements with additional details provided throughout this document.

Table 3: Quality Control Elements

Standardized Quality Reviews: Quality Reviews 1 through 8 provide a framework for independent validation of compliance with FEMA standards and guidance.
Key Decision Points (KDPs): KDPs are codified locations in the Flood Risk Project lifecycle which validates that the Flood Risk Project is ready to move forward into the next stage of project processing. The KDPs are described in more detail in FEMA's guidance document entitled Key Decision Point Process.
MIP Validations by MIP Black Belt or Post-Preliminary Processing / Quality Review leads: This provides a means to ensure that a consistent framework for submittal, storage, and retrieval of technical and administrative data for a Flood Risk Project meet the requirements set forth in FEMAs Data Capture Technical Reference.
DFIRM Validation Tool (DVT) and Metaman Desktop Application: DVT provides a means to ensure that all Flood Insurance Rate Map (FIRM) databases meet the requirements set forth in FEMAs FIRM Database Technical Reference. Metaman validation is a tool provided through the MIP to ensure that requirements set forth in the Metadata Profiles Technical Reference and Metadata guidance document are met. Metaman provides an automated validation of the submitted metadata schema against the chosen metadata profile as well as validation that the metadata meet business rules pertinent to the chosen metadata profile. After running the Metaman tool, the user is provided with an error report that notes any identified problems.
National Flood Hazard Layer (NFHL) Quality Tool: The NFHL QC Checklist describes the checks that all NFHL data submissions must pass. Errors can be identified through several automated solutions, including an NFHL QC tool developed by Customer and Data Services (CDS), and a set of models using third-party FME software, that will identify errors on the checklist. Errors can also be identified using common GIS quality verification tools such as ArcGIS Data Reviewer or any number of custom solutions. Each NFHL check has a "severity" indicator in the QC checklist. High severity errors are those that would directly impact the ability to make correct flood determinations (and thus are usually associated with the Flood Hazard Zones layer) or cause loss of NFHL data integrity / version control. Medium severity errors would be errors in supporting data (S_Fld_Haz_Ar, S_XS, S_BFE, L_XS_Elev, and Study_Info) that could impact attributes other than the flood zone, i.e., static BFE elevations, depth and velocity values, and vertical datum information. While these can cause problems for more advanced users, they do not always affect the ability to make a flood determination. Low severity errors would be those that may lead to confusion or cause redundancy, but they generally do not impact the ability of a user to obtain an accurate flood determination.
FEMA Floodplain Boundary Standard (FBS): Validation of compliance with FBS ensures that floodplain boundaries comply with vertical and horizontal tolerances.
Contractor and CTP Quality Management Plans: See Table 2

2.3 Quality Review Guidance

Validation (review) is a key QC element of a well-functioning QMS. It should not be used as a primary method to build quality into the deliverables, but rather, it should be used to determine how well the prevention measures achieved the desired results.

Validating compliance with regulatory product standards (for the FIRM, FIRM Database, and Flood Insurance Study (FIS) report) is a cornerstone of quality management. This validation activity should be performed internally by Mapping Partners executing the work and should also be conducted

externally following FEMA-mandated reviews at eight checkpoints in the work lifecycle known as QR1 through QR8. Expected outcomes from the QR1 through QR8 process are shown in Table 4.

Table 4: Expected Outputs from Quality Reviews 1 through 8

QR	Outputs	
QR1	• Draft Flood Insurance Rate Map (FIRM) Database & Metadata	• QR1 Passing Report
QR2	• Preliminary FIRM Database & Metadata	• QR2 Passing Report
QR3	• Preliminary Flood Insurance Study (FIS) • Preliminary FIRM panel PDFs • Preliminary FIRM database & Metadata • Preliminary Summary of Map Actions (SOMA) • Completed QR3 Checklist	• Pre-QR3 Submission Questionnaire and Self-Certification form (to be uploaded to the Technical Support Data Notebook [TSDN] in the Mapping Information Platform [MIP]) • Post-QR3 Confirmation and Self-Certification form (to be uploaded to the TSDN in the MIP)
QR4	• Flood Hazard Determination (FHD) Notice • Proposed Federal Register (FR) Notice • Completed QR4 Checklist	• 90-day Start letter to community Chief Executive Officer (CEO) • Standard newspaper publication
QR5	• Final FIRM Database & Metadata • Completed QR5 checklist	• Final FIRM Image Files
QR6	• Letter of Final Determination (LFD) Summary / Docket • LFD Questionnaire • LFD Letters • Final SOMA	• Completed QR6 checklist • Final FR Notice • Draft Flood Elevation Determination Docket (FEDD) File • TSDN
QR7	• Final FIRM Database & Metadata • Final FIRM Image Files • Completed QR7 checklist	• Final FIS Report • Final Map Service Center (MSC) Paperwork
QR8	• Final FIS / FIRM Deliverables to Communities	• Completed QR8 checklist

In addition to the standard Quality Reviews noted in Table 4, mapping partners are expected to execute additional reviews throughout the Flood Risk Product production lifecycle. There are two primary methods advocated as validation techniques; Internal Review by the production firm and External (Independent) Review by a partner firm from within a Joint Venture (JV) or a separate company altogether. Those two methods are described below in Sections 1.3.1 and 1.3.2.

Validation is intended to be a method whereby processes put in place to achieve compliance with standards is yielding the desired results. For FEMA projects, a set of codified standards has been adopted as policy with clear exception protocols also established to enable flexibility on a project-specific basis. Guidance on procuring an exception to FEMA's flood risk analysis and mapping standards is available on the FEMA Knowledge Sharing Site.

The following are general validation guidance points:

- Validation protocols should be executed by qualified reviewers who are not only subject matter experts in the deliverable being reviewed, but also who have been trained as reviewers. It is critical that staff performing validation activities understand the relative importance of each product or data standard being checked and apply good judgment in determining the requirement to make changes to the product and/or recommending changes to the process that yielded the product.
- Reviewers should always be independent of the production process and should be free of associated production pressures including schedule and cost constraints.
- Checklists should be used to validate compliance with Standards for Flood Risk Analysis and Mapping. The checklists should include the producer's response to all non-compliance citations as well as the reviewer's concurrence (indicated by signature) that they agree with the action taken. As stated in Standard ID 190 no product subject to internal or external quality reviews should be allowed to proceed through the production process with unresolved quality concerns arising from validation activities. Checklists should contain the following 5 basic elements:
    1. Description of item being reviewed.
    2. Indication of passing or failing the compliance check.
    3. Ability for the reviewer to comment on the item.
    4. Ability for the product originator to respond to each non-compliance citation indicating how the citation will be addressed and allowing additional comments to be made.
    5. Ability for the reviewer to sign off on the resolution.

Note: Before any products move past the review phase, it is critical that all non-compliance citations arising from internal or external reviews be properly addressed.

2.3.1 Internal Review

To eliminate the potential conflict of interest associated with producers reviewing their own work, it is FEMA's expectation that all products be validated internally by the production firm responsible for the work. If the production firm is part of a JV, it is recommended that the review be conducted by independent staff working in a partner company of the JV that is not associated with the production tasks. If the production firm is not a part of a JV, it is expected that the staff who execute prescribed reviews be independent of the production staff and, accordingly, independent of the project schedule and budget pressures not associated with their review. In short, all internal reviews should be properly resourced, scheduled and executed by qualified reviewers who are completely independent of the production process.

To ensure compliance with FEMA standards, Mapping Partners should have internal validation protocols in place that are integrated into the production workflow. It is expected that qualified reviewers will be identified and available to execute internal reviews and that quality records documenting these reviews will be maintained.

2.3.2 External Review

In addition to internal reviews executed by mapping partners, there are 8 separate external reviews known as QR1 through QR8 summarized in the following Sections that are intended to validate

compliance with FEMA's Flood Risk Standards. Ensuring that these mandated reviews are properly executed and that these reviews leverage the prescribed checklists and Self-Certification forms is a responsibility of each Mapping Partner. Section 4.1 provides details on QR1, Sections 5.1 – 5.2 provides details on QR2 and QR3, Sections 6.1 – 6.5 provides details on QR4 through QR8. Each section provides a detailed workflow for each QR and provides key quality items that should be monitored or reviewed during the development of any regulatory products.

2.4 Continuous Improvement

Continuous Improvement protocols and processes are an essential element of a well-functioning Quality Management System and are intended to ensure that evolving thought, lessons learned, and new best practices are formulated on an ongoing basis and socialized throughout the entire program.

Table 5 provides a summary of continuous improvement elements with additional details provided throughout this document.

Table 5: Continuous Improvement Elements

Integrated Project Teams (IPT): IPTs are temporary stood up by FEMA Subject-Matter Experts (SMEs) to resolve programmatic challenges within their specialty area and to identify options for program improvement to support leadership decisions. These include, but are not limited to the Risk Assessment IPT and the Flood Risk Products IPT.
Communities of Practice (CoPs): There are several CoPs ongoing throughout the program that serve as a regular venue for topic-specific discussions and evolving thought focused on improvement of the program as a whole, such as the CoPs for Engineering and Mapping, Coastal, Mitigation, Levee and Flood Control Structures and Cooperating Technical Partners.
Working Groups: Working Groups are developed to include a team of representatives from all providers that meet regularly to assess program issues and provide efficiencies, recommendations for improvements or enhancements to FEMA. These include a CTP Working Group, Physical Map Revision (PMR) Working Group, Quality Working Group, and Non-Regulatory Flood Risk Product Working Group
FEMA IT Risk MAP Systems Team (FIRST) Team: The core of the group is comprised of Champions, Black Belts, and Regional Program Management Leads (RPML). The purpose of the FIRST group is to act as liaisons and integrators between Risk Management Regional Information Technology (IT) users and FEMA Headquarters (HQ). This multi-disciplinary group collaborates to provide program management, data management, and technical support, and enables communication across the Risk MAP Program IT ecosystem, which facilitates successful delivery of the program and improves whole community resilience.
FEMA Guidelines and Standards Steering Committee: This is a team of representatives from all providers that regularly meets to assess the evolution of standards and guidance and to enable regular updates to keep pace with evolving science and process associated with flood risk analysis and mapping. Regulatory Products Team consist of a FEMA subject-matter expert, , Representatives from Production and Technical Service (PTS) Providers, and Customer Data Services.
FEMA Knowledge Sharing Site: See Table 2
Contractor and CTP Quality Management Plans: See Table 2
Corrective Action / Process Improvement Reports: These enable a forensic analysis of issues that arise, and include a root cause analysis of people, process and tools contributing to the issue as well as a description of the needed correction and whatever process improvements are needed to ensure the issue is not repeated. There is no standard template for this reporting as of the date of this document.

Through the validation and corrective action process, there will often be opportunities identified for minimizing recurrence of non-compliance citations; simply making the correction is not sufficient if the non-compliance citation is likely to be repeated using existing processes. For this reason, it is expected that a root cause analysis for significant issues will be executed to identify contributing factors leading to the non-compliance. This is often best expressed as causes associated with people (training and skills), production process, and/or tools (automated or otherwise).

Once the root cause of significant non-compliance citations is known, solutions should be considered and executed (and monitored for effectiveness) to ensure that the cited issue is not repeated.

Corrective Action / Process Improvement Plans are an ideal way to document and manage corrective action and process improvement activities. Plans of this sort often include the following elements:

- Description of the product / deliverable and background information to frame the issue.
- Description of the issue leading to the corrective action / process improvement.
- Identification of how the issue was noted (internal, external, etc.).
- Description of the extent of the noted issue.
- Description of what should be done to correct the noted non-compliance citation.
- Identification of the entity responsible for making the correction and the due date.
- Root cause analysis to identify contributing factors in terms of people, process, or tools.
- Solutions considered and applied to eliminate future recurrence of the issue.
- Provisions for monitoring the effectiveness of the solution.

On a program level, obtaining external feedback is an important part of the continuous improvement process. A review of the program by an external source, such as the Technical Mapping Advisory Committee (TMAC), helps to ensure program credibility and to validate protocols and processes in place. The TMAC is a federal advisory committee established to review and make recommendations to FEMA on matters related to the national flood mapping program authorized under the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12). The TMAC will review the national flood mapping activities authorized under the law and prepare recommendations to the FEMA Administrator. The TMAC will also produce a report on the impacts of climate sciences and future conditions and how they may be incorporated into the mapping program. The TMAC is comprised of representatives from federal, state, local and private sector organizations as mandated in BW-12 and governed by the Federal Advisory Committee Act (FACA) requirements.

3.0 Integrated Quality Management within Flood Risk Project Lifecycle

The lifecycle of a Flood Risk Project contains multiple quality assurance and quality validation protocols, including provisions to execute the QR1 through QR8 reviews and provisions to procure KDP1 through KDP5 approvals enabling a flood risk project to proceed to the next lifecycle phase. Controls within each of the following Flood Risk Project lifecycle phases are discussed in Sections 3.0 through 6.0, relative to the timeline shown as Figure 1. Additional information on KDPs may be found in FEMA's Key Decision Point (KDP) Process guidance document.

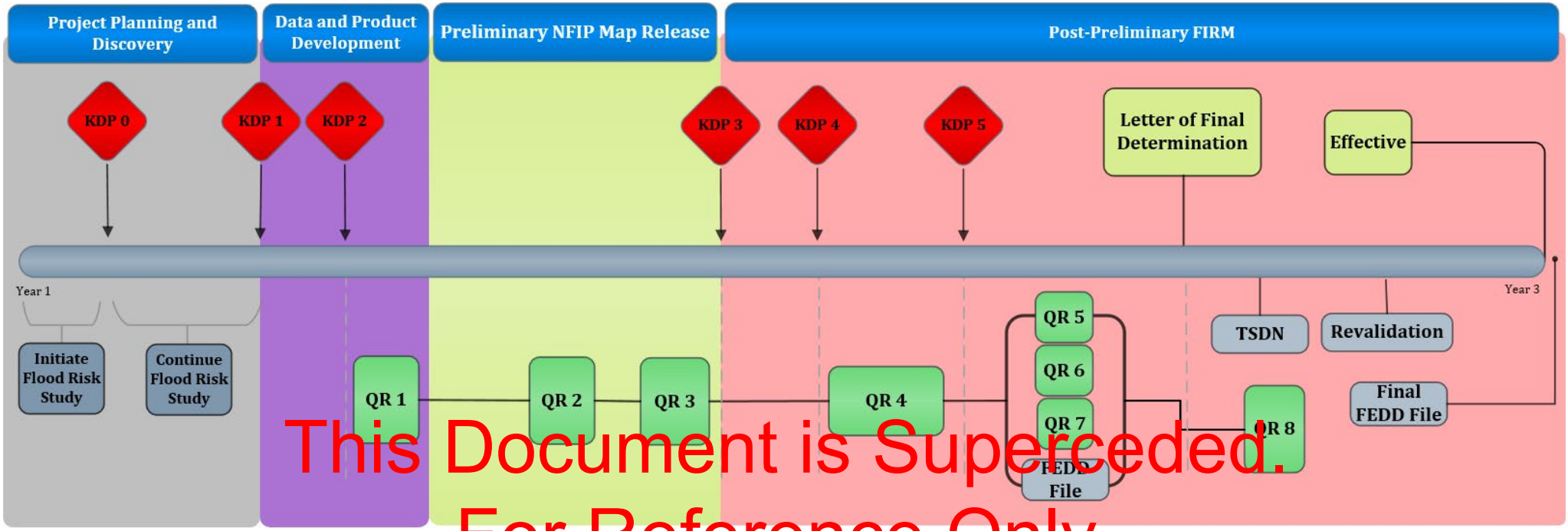

Figure 1. Flood Risk Project Timeline

3.1 Project Planning and Discovery

This phase includes community engagement, Discovery, and all activities leading up to a final decision at KDP1 to proceed with the Flood Risk Project. KDP0 and KDP1 occur in this phase. More information on Quality Management activities in Project Planning and Discovery is provided in Section 3.0 of this Guidance document.

3.2 Data and Product Development

This phase includes topographic data development, engineering analysis, and regulatory FIRM, FIS, and database development, as well as non-regulatory flood risk products. KDP 1 and KDP 2 should have occurred and this phase includes QR1. More information on Quality Management activities in Data and Product Development is provided in Section 4.0 of this Guidance document.

3.3 Preliminary NFIP Map Release

This phase includes all activities related to issuance of the Preliminary NFIP Map, including FIS and database. This includes QR2 and QR3, as well as KDP3, occur in this phase. More information on Quality Management activities in the Preliminary NFIP Map Release phase is provided in Section 5.0 of this Guidance document.

3.4 Post-Preliminary FIRM

This phase includes all activities between issuance of the Preliminary FIRM and the issuance of the effective new or revised Flood Risk Project products (Flood Insurance Study, Flood Insurance Rate Map and database, and any non-regulatory flood risk products). KDP 4 and KDP 5 as well as

QR4 through QR8 occur in this phase. More information on Quality Management activities in the Post Preliminary FIRM phase is provided in 6.0 of this guidance document.

4.0 QA/QC in Project Planning and Discovery

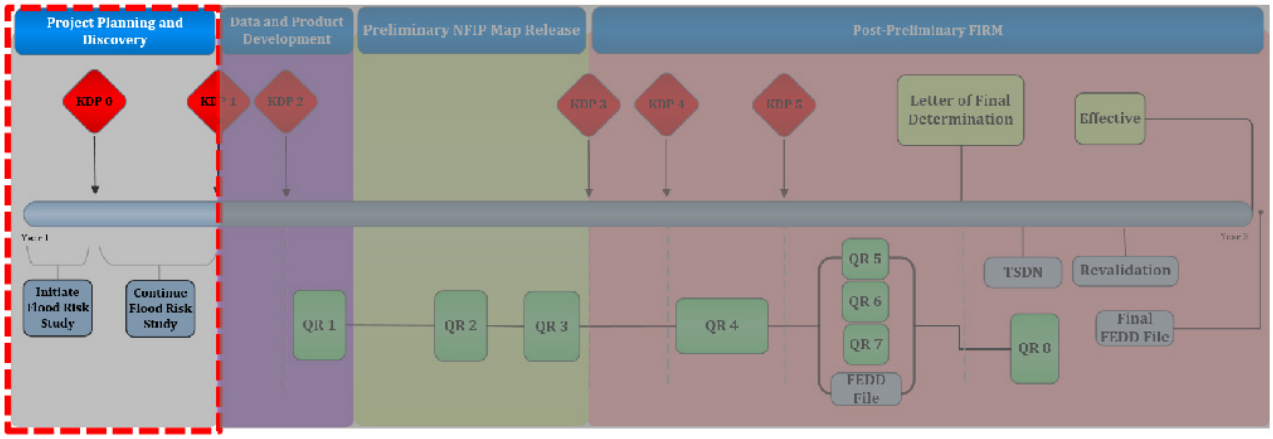

Figure 2: Project Planning and Discovery Phase

Most quality management aspects associated with project planning involve proactive elements designed to yield defensible results associated with the scope of study. Although formal Quality

Validation checks do not occur during the Project Planning and Discovery phase, having a full understanding of FEMA standard and guidance are critical to the decision process. Table 6 provides a summary of QA/QC elements during this phase, with an understanding that QA elements are those activities designed to maximize the potential for a successful project, with QC elements being those activities designed to validate that the things done to enable success yielded the desired results.

Table 6: QA/QC in Project Planning and Discovery

Element	QA / QC
Leveraging the FEMA Coordinated Needs Management System (CNMS) to properly prioritize consideration for a new or revised Flood Risk Project	**QA**
Key Decision Point 0: Validation of the FEMA Regional decision to initiate a Flood Risk Project or group of Flood Risk Projects, including documentation of the rationale for proceeding.	**QA & QC**
Proper Execution of Discovery per FEMA guidance	**QA**
Key Decision Point 1: Validation of FEMA Regional decision to move forward with a Flood Risk Project through data development, risk awareness, and/or outreach tasks including documentation of the rationale for proceeding.	**QA & QC**
Comprehensive data mining to minimize rework associated with late discovery of relevant resources	**QA**
FEMA Sponsored Training for Mapping Partners and CTPs and for regular updates to the Risk MAP standards and guidance	**QA**
Leveraging the FEMA KSS to ensure proactive compliance with FEMA standards and guidance.	**QA**
Leveraging the non-regulatory product checklists (including checklists for the Discovery Report and Discovery Map) at www.fema.gov/media-library/assets/documents/32786	**QC**

5.0 QA/QC in Data and Product Development

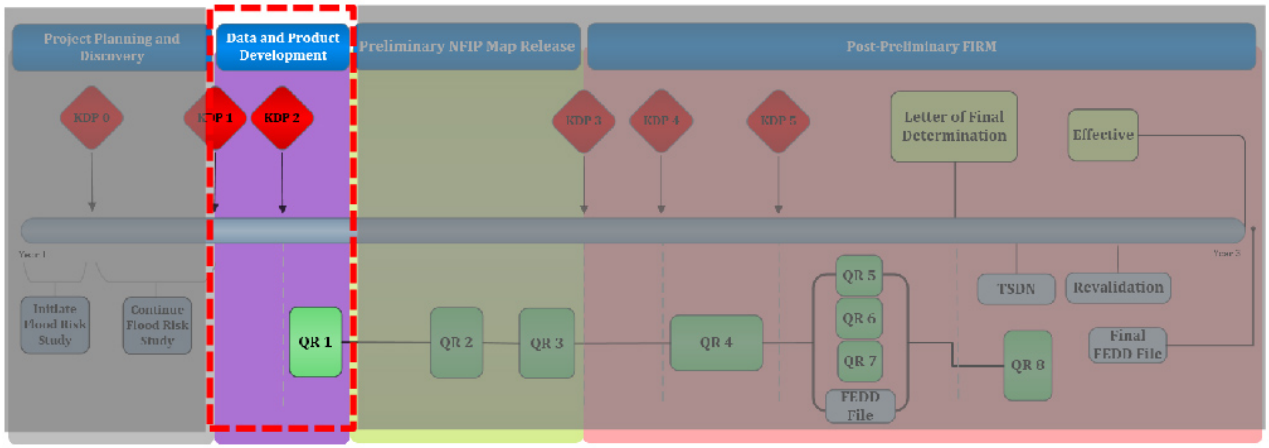

Figure 3: Data and Product Development Phase

Table 7 provides a summary of multiple QA/QC activities occurring during the Data and Product Development phase.

Table 7: QA/QC in Data and Product Development

Element	QA / QC
Leveraging the FEMA Knowledge Sharing Site to ensure proactive compliance with FEMA standards and guidance.	**QA**
Contractor Quality Management Plans containing provisions for QA, QC and continuous process improvement associated with the Data and Product Development phase.	**QA & QC**
Training for Flood Risk Product producers for Data and Product Development.	**QA**
Key Decision Point 1: Validation of FEMA Regional decision to move forward with a Flood Risk Project through data development, risk awareness, and/or outreach tasks including documentation of the rationale for proceeding.	**QA & QC**
Key Decision Point 2: Validation of the FEMA Regional and Headquarters decision to develop a Preliminary FIRM including documentation of the rational for proceeding	**QA & QC**
Production checklists to build quality in to the deliverables	**QA**
DVT and Metadata Tools to ensure compliance with the DFIRM database schema	**QC**
Quality Review 1: Auto-validation of the Draft FIRM Database	**QC**

5.1 Quality Review 1

Figure 4 shows the process associated with execution of the QR1 review.

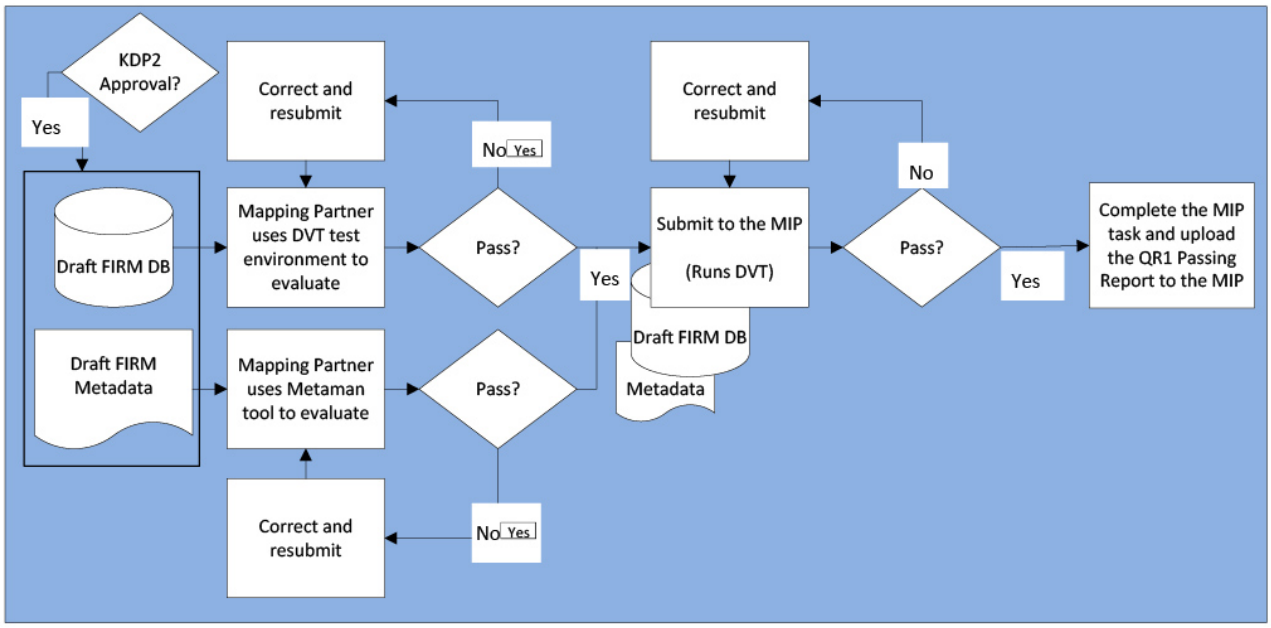

Figure 4: QR1 Process

KDP 2 approval should be received prior to initiating QR1.

QR1 is an auto-validation of the FIRM Database. Mapping Partners are encouraged to leverage the Test Environment in the MIP to ensure that the FIRM Validation Tool (DVT) and Metadata validations that occurs in QR1 is error free before uploading the data.

Once the upload of the Draft FIRM Database to the MIP is complete, the Mapping Partner will auto-validate the uploaded content using the MIP based on the appropriate database schema. The DVT posts a pass/fail notification and provides a link to an automatically generated and detailed Quality Control (QC) report. If the content fails DVT checks, the Mapping Partner must correct the errors and resubmit. The detailed logic for the DVT checks can found in the DVT Guidance document available at www.fema.gov/media-library/assets/documents/34953.

Note: A Flood Risk Project should not advance in the study lifecycle until the Draft FIRM Database has passed QR1. Also, prior to completion of QR1, communities affected by the Flood Risk Project must be provided with the Draft FIRM database and granted a 30-day period to review the data. Additional information regarding this process can be found in the Stakeholder Engagement: Data and Product Development guidance document.

6.0 QA/QC in Preliminary NFIP Map Release

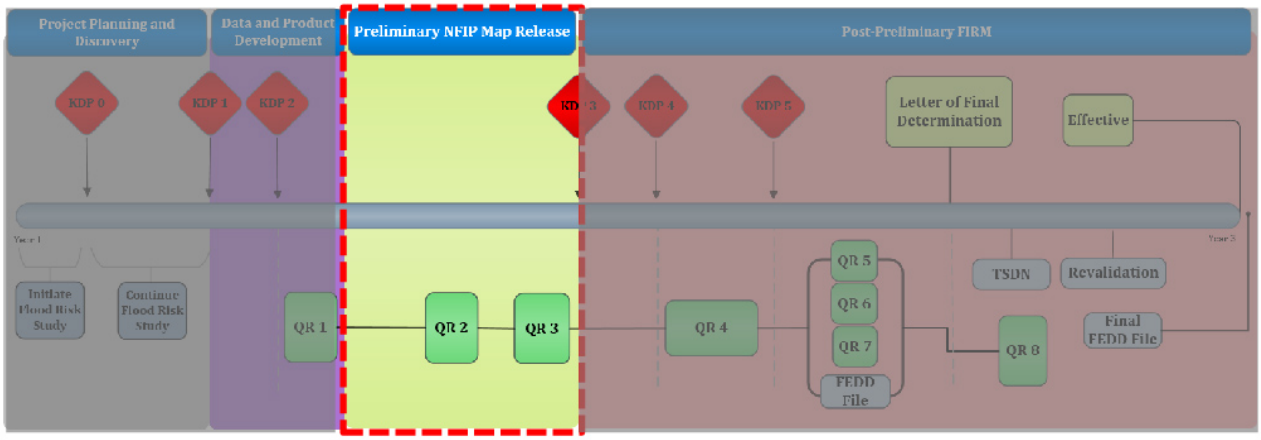

Figure 5: Preliminary NFIP Map Release Phase

Table 8 provides a summary of multiple QA/QC activities occurring during the Preliminary NFIP Map Release phase. Several of these require more explanation than can be summarized in a table; more details are provided immediately following the table for select items.

Table 8: QA/QC in Preliminary FIRM

Element	QA / QC
Leveraging the FEMA Knowledge Sharing Site to ensure proactive compliance with FEMA standards and guidance.	**QA**
Contractor Quality Management Plans containing provisions for QA, QC and continuous process improvement associated with Preliminary FIRM processing	**QA & QC**
Training for Flood Risk Product producers for Preliminary FIRM processing	**QA**
Production checklists to build quality in to the deliverables	**QA**
DVT and Metadata Tools to ensure compliance with the DFIRM database schema	**QC**
Quality Review 2: Auto-validation of the Preliminary FIRM Database	**QC**
Quality Review 3: Auto-validation of the Preliminary FIRM Database and a visual review of Preliminary FIS/FIRMs, Preliminary Transmittal Letters and Preliminary Summary of Map Actions utilizing the standardized FEMA checklists.	**QC**
Key Decision Point 3: Validation of the FEMA Regional and Headquarters decision to distribute the Preliminary FIRM and FIS to communities and documentation of the rationale for proceeding.	**QA & QC**

6.1 Quality Review 2

Figure 6 shows the process associated with execution of the automated QR2 review.

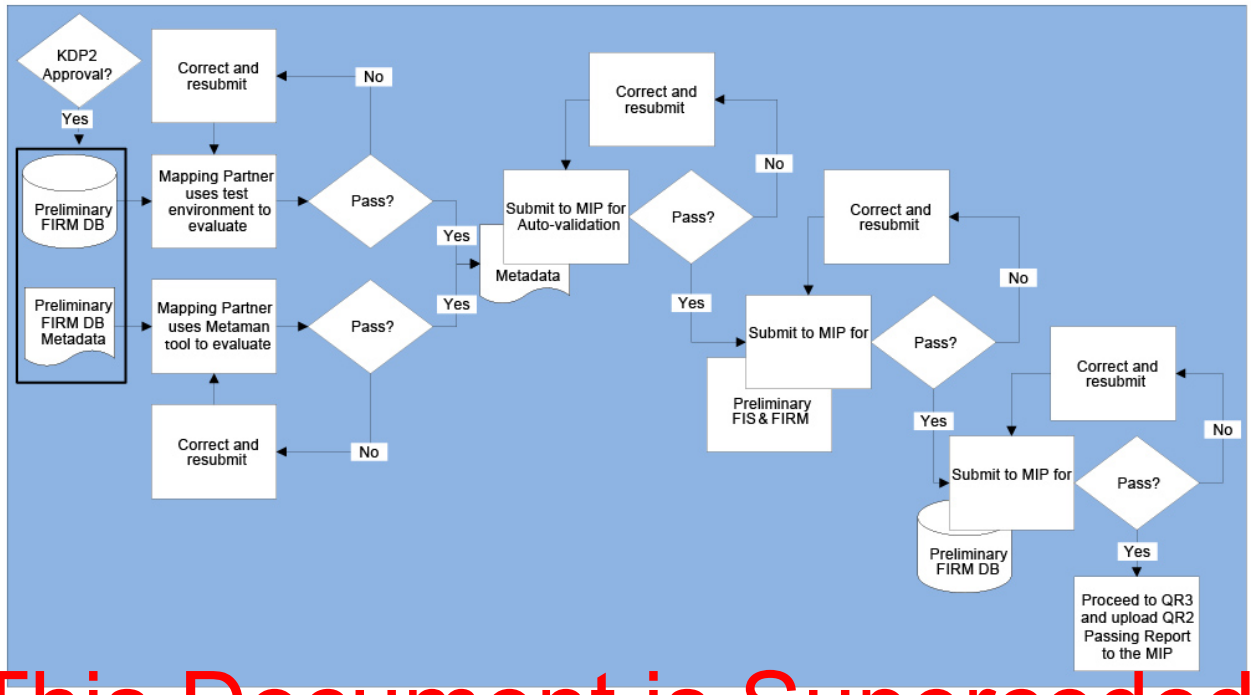

Figure 6: QR2 Process

KDP 2 approval should be received prior to initiating QR2.

QR2 is the auto-validation of the Preliminary FIRM Database. Mapping Partners are encouraged to leverage the Test Environment in the MIP to ensure that the FIRM Validation Tool (DVT) and Metadata validations that occurs in QR1 is error free before uploading the data.

Once the upload of the Draft FIRM Database to the MIP is complete, the Mapping Partner will auto-validate the uploaded content using the MIP based on the appropriate database schema. The DVT posts a pass/fail notification and provides a link to an automatically generated and detailed Quality Control (QC) report. If the content fails DVT checks, the Mapping Partner must correct the errors and resubmit. The detailed logic for the DVT checks can found in the DVT Guidance document available at www.fema.gov/media-library/assets/documents/34953.

Note: A Flood Risk Project should not advance in the study lifecycle until the Preliminary FIRM Database has passed QR2.

6.2 Quality Review 3

Figure 7 shows the process associated with execution of the QR3 review.

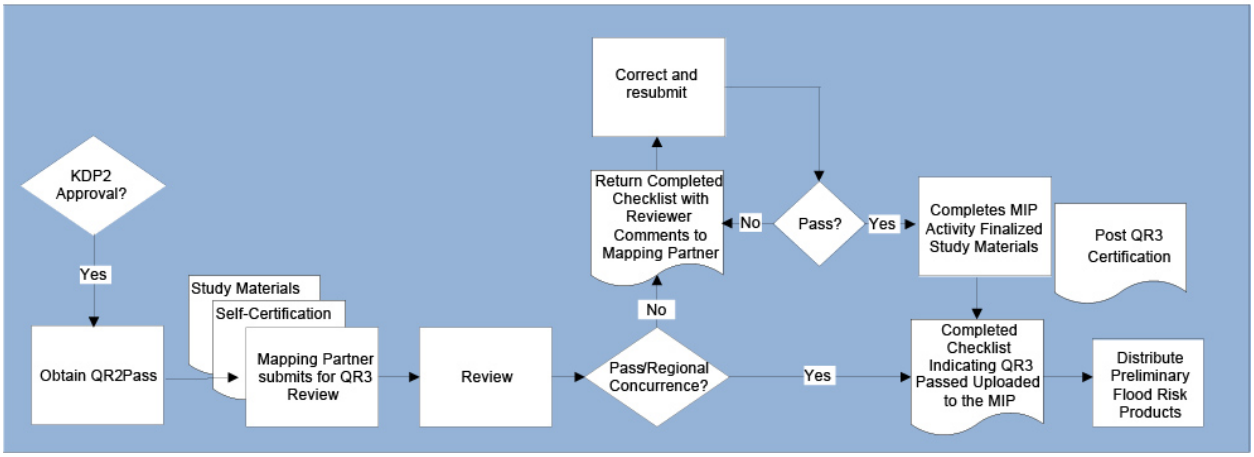

Figure 7: QR3 Process

KDP 2 approval should be received prior to initiating QR3. The auto-validation (QR2) and FEMA's visual check (QR3) cannot be performed concurrently. The QR2 review must be completed before the QR3 review may begin.

QR3 review involves a 10 percent review of the preliminary or revised preliminary FIRM panels and 100 percent review of the FIS report, preliminary SOMA, transmittal letters and incorporation of LOMRs that revise the effective FIRM. These items will be visually reviewed to validate compliance with FEMA's standards. FEMA expects that all products ready for QR3 have been through each Mapping Partner's internal quality control reviews and that adequate quality records (checklists, etc.) demonstrating the reviews have been kept.

Each Mapping Partner must complete and submit a signed copy of the Pre-QR3 Submission Questionnaire and Self-Certification form to FEMA (or their designee) two weeks prior to QR3 commencement. The form is intended to facilitate the QR3 review by providing insight into Flood Risk Project complexity as well as potential challenges and quality issues that arose during the production process. This form also builds in Mapping Partner accountability by requiring self-certification of compliance with all FEMA standards.

Once all materials have been submitted for review via the MIP and all auto-validation through the MIP have occurred, FEMA (or their designee) will typically complete the QR3 review within 30 days using the QR3 Checklist and complete the appropriate MIP task. Mapping Partners are expected to correct any errors noted during the review or provide a reason the correction was not made. Each review comment on the QR3 Checklist is then noted in the Originator Disposition column as either "will comply and make changes" or "disagree – see originator comments". If the originator disagrees, they should provide a reason in the Originator Comments column. Any disagreements must be coordinated with the QR3 review team before the Flood Risk Project is released for preliminary distribution. Upon correction of the QR3 review comments and, prior to issuance of the preliminary FIS and FIRM, the Mapping Partner must return the QR3 Checklist (with a response noted for each item) to the QR3 reviewer. Prior to KDP 3 submittal, the Mapping Partner must provide a signed copy of the Post-QR3 Corrections Confirmation and Self-Certification form to the QR3 reviewer.

These forms will serve as records that all noted issues have been resolved before preliminary issuance, and all preliminary products must be uploaded to the MIP to comply with the Data Capture Technical Reference requirements. It is especially critical to upload any Quality Review checklists to the MIP at this point as well.

This data will be stored in the MIP and Preliminary FIS, Database and Panels will be published to the MSC website. Accurate entry of the Preliminary Issue date, which is date stamped on the preliminary panel(s), at this MIP task and the timely completion of the activity, is important for the accurate publishing of the data to the public-facing Map Service Center (MSC)site.

As it pertains to the QR3 Preliminary SOMA review, Mapping Partners should exhaust all reasonable measures to obtain the necessary information to review valid Letters of Map Change (LOMCs) when assessing these. The QR3 review team then reviews content on the MIP and the Preliminary SOMA document to verify that the Mapping Partner has complied with associated FEMA standards and Summary of Map Actions and Revalidation Letters guidance document.

Note:

- KDP 3 must be approved prior to the distribution of Preliminary Products and once QR3 has passed.
- Mapping Partners who do not submit Preliminary products to FEMA for QR3 review (e.g., Production and Technical Service [PTS] Providers) are expected to upload a similar self-certification document to the MIP before performing internal reviews.
- It is important that the Community Map Repository (CMR) address is accurate and matches in all preliminary products, including FIS, database, and index (if applicable). To assist the public in identifying where the maps are located at the community, it is preferred that Mapping Partners including the building name as part of the address as well. A Community Map Repository (CMR) address must be a physical address and cannot be a P.O. Box. Below are examples of a CMR address:

Town of Floodtown	City of Floodville
Town Hall	Floodville City Hall
100 1st Street	1 Main Avenue, Suite 100
Floodville, VA 00000	Franklin, VA 00000

After the preliminary products have been reviewed and all MIP tasks completed the Mapping Partner will send the preliminary transmittal letters, SOMA, FIS Report, FIRM database, and FIRM panels to the affected community. Please refer to Preliminary Distribution and Revised Preliminary guidance document for further information on distribution requirements.

7.0 QA/QC in Post-Preliminary FIRM

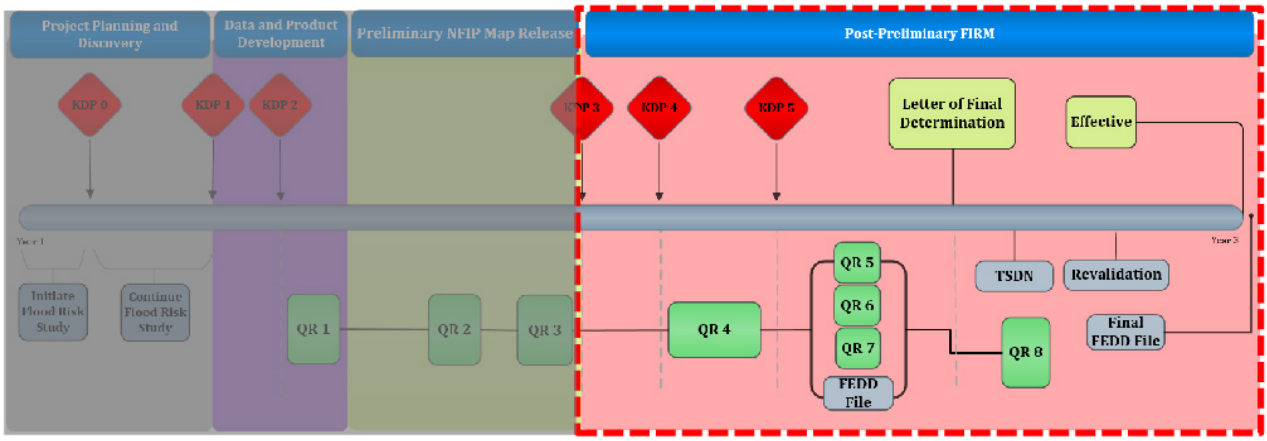

Figure 8: Post Preliminary FIRM

Table 9 provides a summary of multiple QA/QC activities occurring during the Post-Preliminary phase. Several of these require more explanation than can be summarized in a table; more details are provided immediately following the table for select items.

Table 9: QA/QC in Post Preliminary FIRM

Element	QA / QC
Leveraging the FEMA Knowledge Sharing Site to ensure proactive compliance with FEMA standards and guidance.	**QA**
Contractor Quality Management Plans containing provisions for QA, QC and continuous process improvement associated with post-preliminary FIRM processing.	**QA & QC**
Training for Flood Risk Product producers for Post-Preliminary FIRM processing.	**QA**
Post Preliminary training for Flood Risk Product producers.	**QA**
Key Decision Point 4: Validation of the Headquarters decision to initiate the Appeal Period and documentation of the rationale for proceeding.	**QA & QC**
Production checklists to build quality in to the deliverables.	**QC**
Quality Review 4: Validates Proposed Flood Hazard Determination Notice, Appeal Start Docket, Newspaper Notice(s), and Appeal Start Letter(s) utilizing the standardized FEMA checklists.	**QC**
Key Decision Point 5: Validation of the Headquarters decision to issue the Letter of Final Determination (LFD) and documentation of the rationale for proceeding.	**QC**
Quality Review 5: Auto-validation of the Post-Preliminary FIRM Database and a visual review of Post-Preliminary FIRMs and Database utilizing the standardized FEMA checklists	**QC**

Element	QA / QC
Quality Review 6: Visual review of the LFD Products including LFD Verification Form, LFD Questionnaire, LFD Letter(s), Federal Register Part 67 Final Notice, FEDD File, and Final SOMA(s) using FEMA standardized checklists.	**QC**
Quality Review 7: Visual review of the FIS Report, FIRM and associated MSC Deliverables using FEMA standardized checklists.	**QC**
Quality Review 8: A review of the FIS Report, FIRM, MSC paperwork, and delivery manifest shall be conducted by the FEMA Map Service Center using FEMA standardized checklists.	**QC**
DVT and Metadata Tools to ensure compliance with the DFIRM database schema	**QC**
Revalidation Letter Review: This review is conducted by FEMA HQ (or their designee) prior to map effective date and production of these letters is discussed in FEMA's Summary of Map Actions and Revalidation guidance. The revalidation package should be submitted for review four weeks prior to the effective date. No less than two weeks prior to the map effective date, the revalidation docket is submitted to FEMA HQ by the PTS Providers for approval.	**QC**
TSDN Review: This review is conducted by FEMA HQ (or their designee) and data submittal requirements are discussed in FEMA's Technical Support Data Notebook and Flood Elevation Determination Docket guidance. The TSDN checklist to utilize during this review is found at www.fema.gov/library/viewRecord.do?id=7577. The TSDN and checklist must be submitted by the Mapping Partner to FEMA HQ (or their designee) no later than 30 days following LFD. The TSDN must be archived in full no later than 60 days following the map effective date.	**QC**
Final FEDD File Review: While the initial FEDD file review through LFD is completed as part of QR6, the final FEDD file compilation and review is conducted by FEMA HQ (or their designee) after the project has gone effective and utilizes the same FEDD file checklist as was completed during QR6. The list of data products that is submitted for this further discussed in FEMA's Technical Support Data Notebook and Flood Elevation Determination Docket guidance. The FEDD file checklist to utilize during this review is found at www.fema.gov/library/viewRecord.do?id=7577.	**QC**

7.1 Quality Review 4

Figure 9 shows the process associated with execution of the QR4 review.

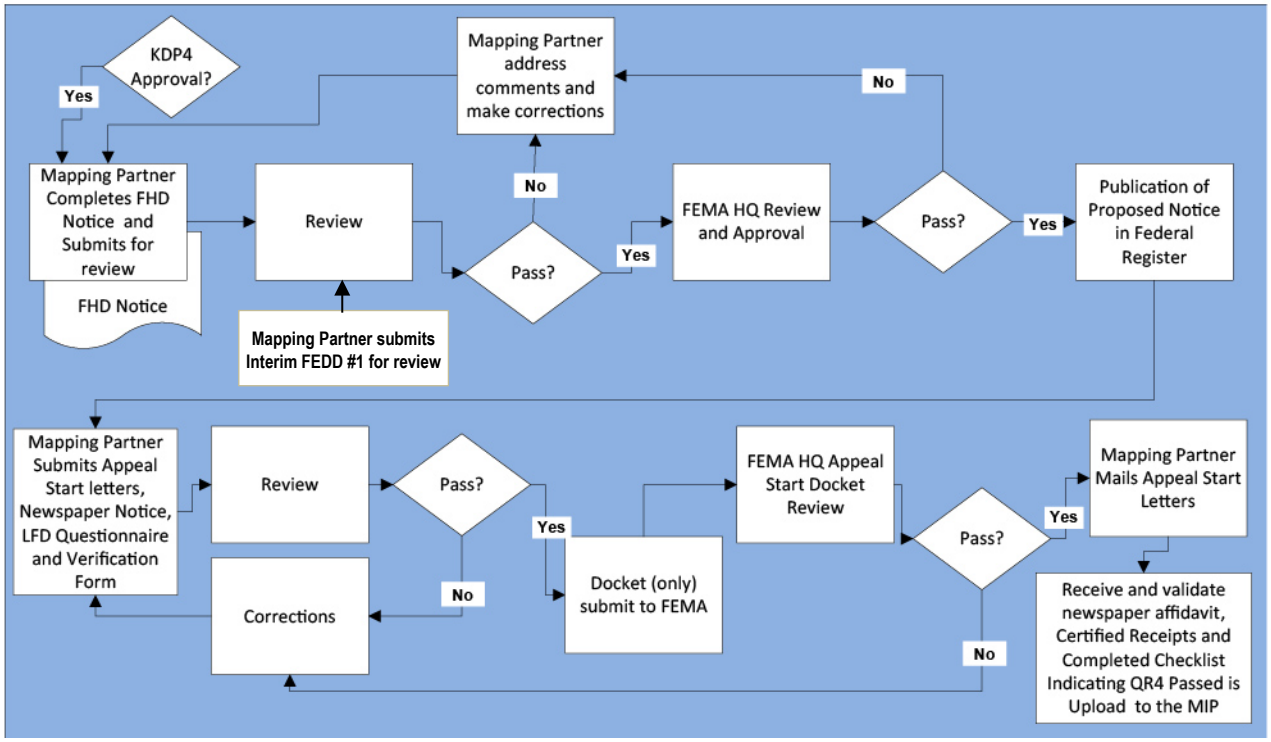

Figure 9: QR4 Process

KDP 4 approval should be received prior to initiating QR4 if a statutory 90-day appeal period is required. The QR4 Review validates the Proposed Flood Hazard Determination (FHD) Notice, Appeal Start Docket, Appeal Start Letters, and Newspaper Notice. Concurrently with QR4 Part 1, the mapping partner must submit all required FEDD File components up through the CCO Meeting. The PTS Provider will perform Interim FEDD File Review 1, and the review must pass with QR4 Part 1 prior to the proposed notice being routed for Federal Register publication. See the Post-Preliminary Deliverables guidance document for details on the FEDD file process.

QR4 – Flood Hazard Determination Notice Review – Part 1

The Mapping Partner must enter the proposed flood hazard determination notice information in the MIP needed for the FHD on the web publication. The Mapping Partner should then submit the notice to FEMA (or their designee) for review. Note that PTS will complete their own submittal and review. The timing of submittal should be approximately 60-90 calendar days prior to the anticipated mailing date of the Appeal Start letters to the CEO of the community. This will allow FEMA time to review, prepare, and publish the proposed notice in the Federal Register.

Note: Per FEMA Risk MAP standard 601, the Community Map Repository physical address (i.e., Town of Floodtown, 100 Main Street, Floodtown, VA), including the community name and type, must be accurate and consistent across all products, including FHDs on the web notice, Federal Register proposed notice, FIRM index or FIS report (where applicable), and FIRM database, both online and hard copies. Inconsistent or inaccurate CMR addresses may result in project delays, as the hard copy versions of the corrected products will need to be provided to the impacted communities with the accurate physical address prior to appeal period start, per

standard 601. Corrected product versions must also be visible online. Examples of CMR addresses are provided in Section 5.2 of this document.

The Mapping Partner must correct any errors identified by FEMA (or their designee) prior to the FHD Notice publication in the Federal Register. The proposed notice publication in the Federal Register will occur prior to mailing the Appeal Start letter to the CEO. The Federal Register publication process should not begin until the FEMA Regional Office has affirmed that they are ready to move forward with the appeal period.

QR4 – Appeal Start Letter and Docket Review – Part 2

Following publication of the proposed notice in the Federal Register, the assigned Mapping Partner coordinates publication dates with the newspaper(s), completes the necessary MIP tasks by populating the appeal start and end dates. FEMA expects that the assigned Mapping Partner will submit the Appeal Start Docket, Newspaper Notice, and final draft Appeal Start letters with all attachments to FEMA (or their designee) for review immediately following Federal Register notice publication. Note that PTS will complete their own submittal and review. The 90-day comment period for the Federal Register notice publication and the statutory 90-day appeal period must overlap by at least one day. If the statutory 90-day appeal period does not begin prior to the end of the Federal Register notice 90-day comment period, in coordination with FEMA, the Federal Register publication must be withdrawn and the FHD notice must be republished.

Following the QR4 review, the Mapping Partner must correct any errors identified by FEMA (or their designee) prior to the Appeal Start letter distribution. The Mapping Partner should also ensure that newspaper publication dates as well as appeal period start and end dates in the MIP are updated and accurate. FEMA's review typically will take two weeks to complete and thus the submittal of the documents for review should be done approximately four weeks prior to target mail date. The Appeal Start Docket should be provided by FEMA (or their designee) for approval two weeks prior to target mail date. An approved docket must be received from FEMA HQ prior to the issuance of the Appeal Start Letters by the Mapping Partner responsible.

The Mapping Partner should ensure that the CEO receives the Appeal Start letter (or a digital copy of the letter, such as a fax or PDF copy sent via email if the hard copy is not delivered) at least one day prior to the first newspaper publication date but no more than 10 days before the second newspaper publication date. It is recommended that the letters be mailed two weeks prior to the second newspaper publication date via certified mail or FedEx, such that the appeal period is started within the 10-day period immediately following the CEO receiving the letter. The Mapping Partner must document in the FEDD File that the CEO received the letter prior to the first newspaper publication date. A copy of the published proposed Federal Register notice, which is available online at www.gpo.gov/fdsys/search/home.action, must be enclosed with the Appeal Start letter to the CEO.

If any errors are identified in the Federal Register Proposed FHD Notice or the local newspaper notice news release, the Mapping Partner should notify FEMA immediately so a correction notice can be prepared. The community and other affected stakeholders should be notified when corrections to the news release or Federal Register are required including timelines for publishing corrections. A new Appeal Period may be needed as a result.

There are two sub-steps a Mapping Partner must complete related to QR4 Appeal Start Letter and Docket Review and they are identified below:

1. Publish FHD Notice on FEMA's website and in the local newspaper.

   The Mapping Partner should ensure that the standard FHD Notice is posted with the correct newspaper publication dates and appeal period start and end dates on FEMA's website at www.floodmaps.fema.gov/fhm/BFE_Status/bfe_main.asp prior to issuing the Appeal Start letters. The Mapping Partner is expected to ensure that the notice remains available for viewing during the duration of the statutory 90-day appeal period. Additionally, the Mapping Partner is responsible for ensuring publication of the standard FHD notice in the local newspaper.

2. Validate and receive affidavit from newspaper.

   The Mapping Partner should ensure that the newspaper publication occurred on the dates listed in FHDs on the Web and the Appeal Start letter. In addition, the Mapping Partner must update the FHDs on the Web with the affidavit dates.

Note: The completed QR4 checklist should be uploaded to the MIP, by the Mapping Partner, immediately following Appeal Start Letter distribution.

7.2 Quality Review 5

Figure 10 shows the process associated with execution of the QR5 review.

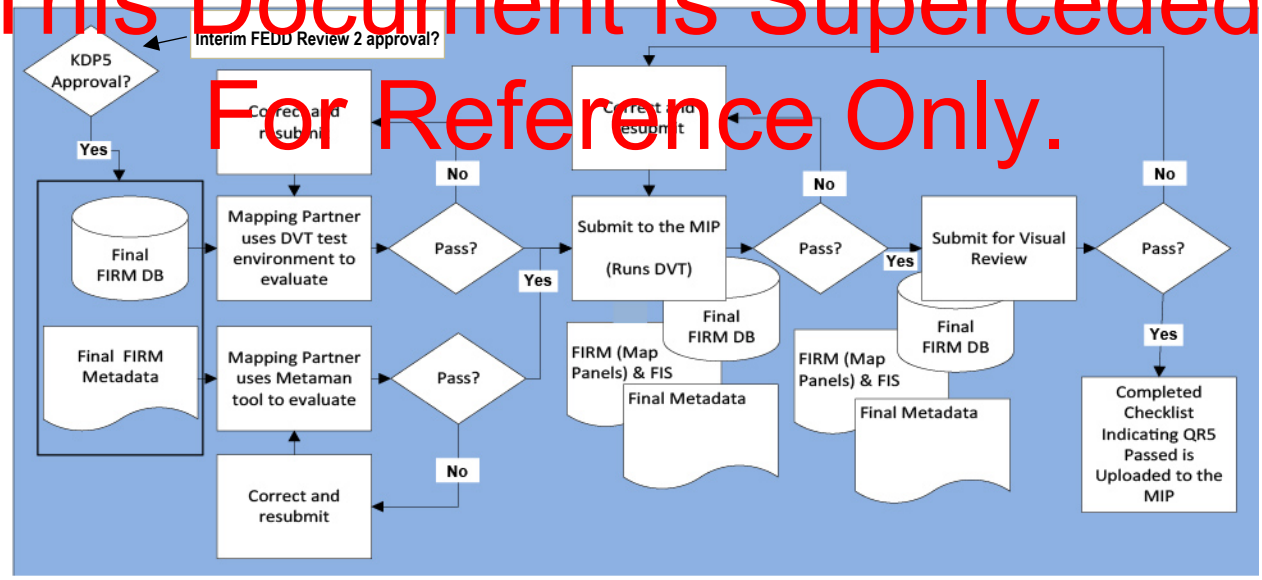

Figure 10: QR5 Process

Prior to submitting the KDP 5 form an Interim FEDD File Review 2 must be submitted by the mapping partner and pass review. This process includes a review of the appeal start and appeal/comment resolution documents. KDP 5 approval should then be received prior to initiating QR5.

The QR5 process validates that the FIRM panels agree with the final FIRM database in addition to the MIP auto-validation of the final FIRM Database and Metadata. The Mapping Partner

submits the final FIRM database and georeferenced FIRM panels to FEMA (or their designee), via the MIP at least 60 days prior to the anticipated LFD date. Note that PTS will complete their own submittal and review.

Mapping Partners are encouraged to leverage the Test Environment in the MIP to ensure that the FIRM Validation Tool (DVT) and Metadata validations that occurs in QR5 is error free before uploading the data.

Once the upload of the Final FIRM Database to the MIP is complete, the Mapping Partner will auto-validate the uploaded content using the MIP based on the appropriate database schema. The DVT posts a pass/fail notification and provides a link to an automatically generated and detailed Quality Control (QC) report. If the content fails DVT checks, the Mapping Partner must correct the errors and resubmit. The detailed logic for the DVT checks can found in the Database Verification Tool (DVT) guidance document available at www.fema.gov/media-library/assets/documents/34953.

The visual agreement checks will be completed within 30 to 40 days depending on the size of the Flood Risk Project. This review will consist of the QR5 checklist being filled out as well as a shapefile identifying the comments based on point locations. These comments are provided to the mapping partner. The remaining 20 to 30 days allow for corrections to be coordinated with the Mapping Partner.

A Flood Risk Project must pass QR5 before the LFD may be distributed. If the QR5 review indicates significant quality concerns, the LFD date may be delayed after coordination with FEMA. A passing QR5 report and confirmation from FEMA (or their designee) must be documented.

Note: QR5 checklist should be uploaded to the MIP by the Mapping Partner immediately following the passing of QR5.

7.3 Quality Review 6

Figure 11 shows the process associated with execution of the QR6 review.

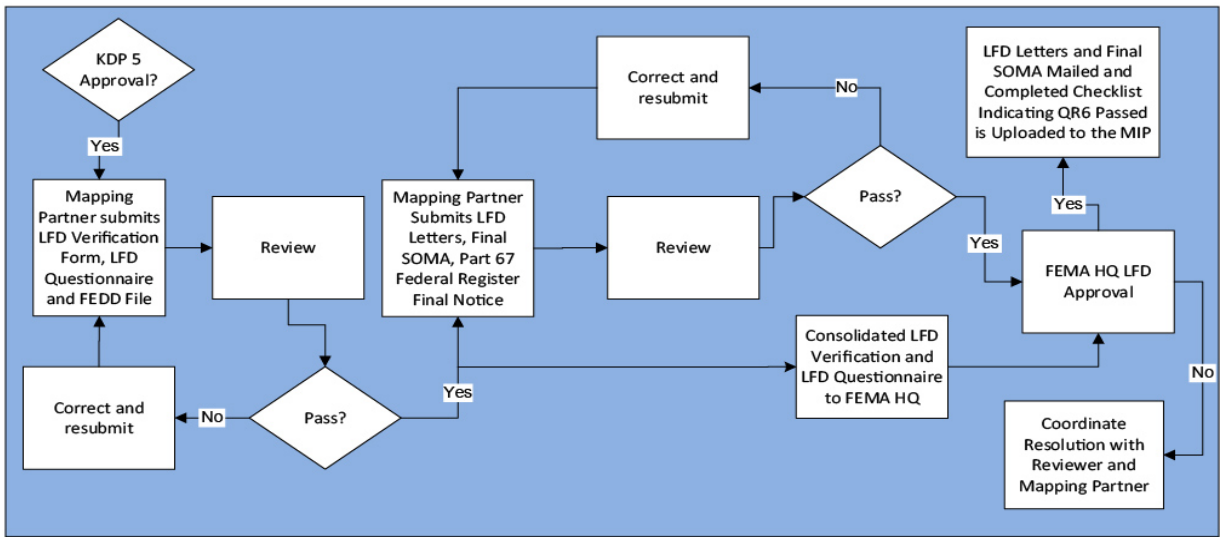

Figure 11: QR6 Process

A passing Interim FEDD File Review 2 and KDP 5 approval should be received prior to initiating QR6.

The QR6 process validates the LFD prior to the distribution of the final products. The LFD date must be no sooner than 60-days after the end of the statutory 90-day appeal period or following resolution of all appeals, whichever is later.

At least 60 days prior to the projected LFD date, the Mapping Partner is responsible for preparing and submitting to FEMA HQ (or their designee) for review, concurrent with QR5 and QR7 the following:

- Letter of Final Determination Verification Summary Form
- Letter of Final Determination Questionnaire
- FEDD Files with checklist

Note: PTS will complete their own submittal and review. FEMA (or their designee) will review the LFD submittal and return them and completed QR6 checklist to the Mapping Partner within 14 calendar days. Any deficiencies found in the due process steps discovered through the FEDD file review may result in a cancellation of the LFD.

At least 45-days before the projected LFD date the Mapping Partner must submit to FEMA (or their designee) the following:

- The final Letter of Final Determination letters
- Federal Register Part 67 Final Notice
- Final Summary of Map Actions

The Final SOMA should be completed in the MIP using the SOMA tool. FEMA expects the Mapping Partner to maintain awareness of LOMCs, especially LOMRs, issued during the mapping project by reviewing the MIP and coordinating with the LOMC production team. Mapping Partners must incorporate (into the final map products) all effective LOMRs issued at least two months prior to the projected LFD date. Only FEMA HQ can authorize not incorporating a LOMR in favor of reissuing the LOMR after the new maps are effective. Therefore, the Mapping Partner should provide documentation of coordination with FEMA HQ (as well as the region) if a LOMR will be reissued rather than incorporated. The Mapping Partner should check the SOMA tool on the LFD date to ensure no new LOMCs require categorization and should be added to the SOMA.

FEMA (or their designee) will review and provide the completed QR6 checklist to the Mapping Partner within 14 calendar days. Any errors that are identified must be promptly resolved prior to issuance of the LFD.

FEMA HQ LFD Approval

No less than two weeks before the LFD the final LFD Verification Form and LFD Questionnaires should be consolidated by the PTS and sent to FEMA HQ for approval. LFD letters should not be mailed until FEMA HQ approval is received. Mapping Partners should confirm with FEMA HQ (or their designee) regarding who will mail the LFD letters, as contracts will vary. In general, CTP studies will have LFD letters mailed out by the regionally-assigned PTS on behalf of FEMA HQ.

The appropriate MIP task should be promptly completed following LFD issuance.

Note: The completed QR6 checklist should be uploaded to the MIP, by the Mapping Partner at the issuance of LFD.

7.4 Quality Review 7

Figure 12 shows the process associated with execution of the QR7 review.

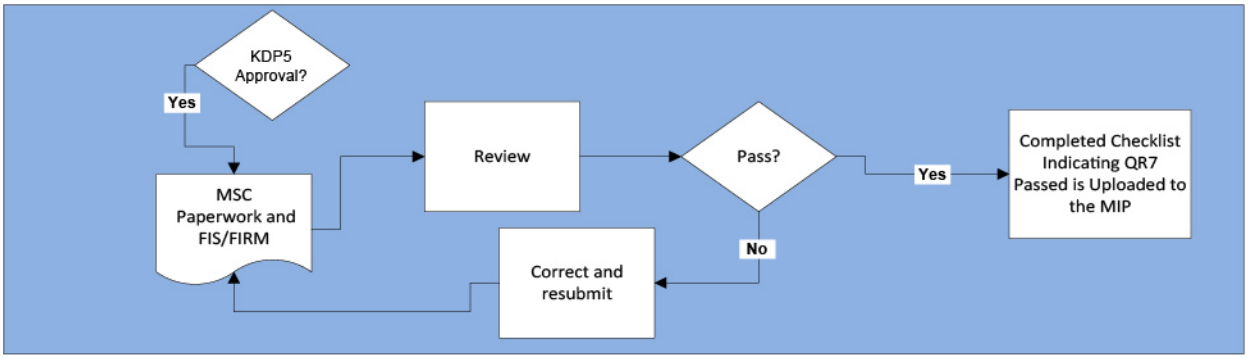

Figure 12: QR7 Process

A passing Interim FEDD File Review 2 and KDP 5 approval should be received prior to initiating QR7.

The QR7 process validates that the FIS, FIRM and associated paperwork are in compliance with FEMA standards before delivery to the MSC.

At least 60-days prior to the projected LFD date (coincident with QR5 and QR6) after receiving a passing auto-validation report for the final FIRM database, the Mapping Partner will submit for QR7 in the MIP. Note that PTS will complete their own submittal and review. The MSC Paperwork and FIS Report should be uploaded to the MIP per requirements outlined in the Data Capture Technical Reference document. Once FEMA receives the MSC deliverable from the Mapping Partner, FEMA (or their designee) will review the data within 30 days. If quality issues are documented in the QR7 Checklist the Mapping Partner is expected to resolve these issues and resubmit the deliverable for review. The QR7 Checklist includes a "Reviewer Verification" column that should include the reviewer's initials for each failed review item. This process will continue until the deliverable is determined to be in full compliance with FEMA's standards.

The Flood Risk Project must pass QR7 before the LFD will be distributed.

Note: The completed QR7 checklist should be uploaded to the MIP, by the Mapping Partner, at this time as well.

7.5 Quality Review 8

Figure 13 shows the process associated with execution of the QR8 review.

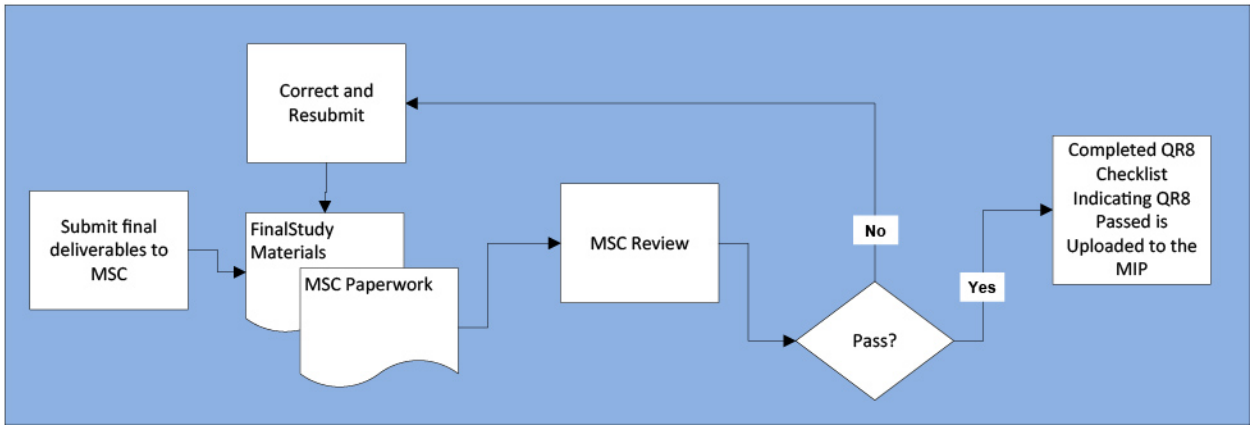

Figure 13: QR8 Process

The QR8 process validates compliance of the final products before delivery to the end users.

Within one week after LFD, the MSC will conduct the QR8 review of the FIRM panels, FIS Report and the MSC paperwork using a FEMA standardized checklist. The review will focus on the political area identifiers, NFIP program dates, product distribution information, and linkages to the MSC store.

The QR8 initial review will be completed within 14 calendar days, and any errors will be communicated by the FEMA Regionally-assigned PTS provider, who will then coordinate with the Mapping Partner for resolutions. The QR8 Checklist includes a "Reviewer Verification" column that should include the reviewer's initials, for each failed review item. If any issues are cited during the QR8 review, FEMA's PTS Provider will work with the Mapping Partner and MSC to resolve all open issues. Corrected materials will be uploaded to the MIP by the Mapping Partner and the task will be completed within seven calendar days.

Note: The completed QR8 checklist should be uploaded to the MIP, by the Mapping Partner, at this time as well.

7.6 TSDN

The TSDN review validates that the data identified on the TSDN Checklist is uploaded to the MIP and ensures completeness of all data related to the Flood Risk Study. Using the Technical Support Data Notebook and Flood Elevation Determination Docket guidance document, the Mapping Partner will submit to the MIP the completed TSDN checklist and signed Project Completion Certification form to FEMA (or their designee) no later than 30 days after LFD for review. FEMA (or their designee) will work with the mapping partner on addressing any comments as part of this review and the finalized TSDN Checklist will be archived to the MIP. Note that PTS will complete their own submittal and review.

7.7 Revalidation and Final FEDD

The Revalidation Letter

The Mapping Partner should complete all categorization for any new LOMCs, which have been issued since LFD, in the MIP using the SOMA tool. FEMA expects the Mapping Partner to maintain awareness of LOMCs issued through the effective date of the study. Please refer to

the Summary of Map Actions and Revalidation Letters guidance document for more information related to the production of the revalidation letter(s). The revalidation letters and revalidation docket are submitted to FEMA (or their designee) no later than 30 days before the effective date of the study. The revalidation letter review is conducted to ensure that LOMCs that are not incorporated are revalidated through this process. The Mapping Partner will work with FEMA (or their designee) to resolve all comments.

No less than two weeks before the effective date the final revalidation docket should be consolidated by the PTS and sent to FEMA HQ for approval. HQ will provide approval to mail the revalidation letters around the effective date of the study. Revalidation letters should be mailed by the Mapping Partner one day after the FIRM effective date. It is important for the Mapping Partner to check the SOMA tool for any newly issued LOMCs that have not been categorized in the SOMA tool up to the effective date of the FIRMs. If any changes are required to be made to the revalidation letters after HQ provided the approval or the FEMA review of the revalidation letters has occurred, the Mapping Partner must notify FEMA (or their designee) immediately so these can be reviewed again. Note that PTS will complete their own submittal and review.

Final FEDD File

Once a Flood Risk Project has become effective, all necessary documentation is available to finalize the FEDD File and submit this final compilation to the MIP. No later than 60 days after the effective date of the Flood Risk Project, the designated PTS must obtain Suspension Letter documentation, the published Final Notice and mailed Revalidation Letters to complete the requirements of the FEDD File. For further information on the FEDD File Components and final archiving please see the Technical Support Data Notebook and Flood Elevation Determination Docket guidance document. This final archiving allows for all administrative due process data to be inserted into the already compiled FEDD File.

7.8 Quality Review for Non-Regulatory Flood Risk Datasets and Products

To ensure the highest chance of delivering quality Flood Risk Datasets and Products, Mapping Partners should map out a process that calls for iterative reviews of the non-regulatory datasets and products conducted at strategic points in the data and product development lifecycle. The minimum requirements for producing a quality Flood Risk Product and individual flood risk datasets are defined in Standard #628, with additional definition for Water Surface Elevation Grids in Standard #415.

Mapping Partners who do not already have QC checklists for review of Flood Risk Datasets and Products may use the checklists posted at www.fema.gov/library/viewRecord.do?id=7577.

As any dataset, product or interim product is to be provided to a community or other stakeholder in the Flood Risk Project lifecycle, the dataset or product should be reviewed to the extent possible at that stage. For example, a dataset such as Areas of Mitigation Interest (AoMI) may be digitally displayed for a discussion with communities, and it is known to only be partially populated at that stage. The features that are populated should be reviewed to ensure they are appropriate for use and accurate, but it shouldn't be reviewed with the intensity of the final Flood Risk Database using a full checklist approach.